NOTES ON LIFE HISTORIES AND BIOLOGY OF THE SPECIES OF *NEOHESPERILLA* WATERHOUSE AND LYELL (LEPIDOPTERA: HESPERIIDAE)

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Abstract

The life histories and biology of *Neohesperilla crocea* (Miskin), *N. senta* (Miskin), *N. xanthomera* (Meyrick and Lower) and *N. xiphiphora* (Lower) are described. The species feed on the grasses *Chrysopogon aciculatus* (Retz), *Themeda triandra* Forsk, *Heteropogon* sp. and *Schizachyrium perplexum* S.T. Blake (all Poaceae) respectively.

Introduction

The genus *Neohesperilla* Waterhouse and Lyell contains four small yellowish brown skippers from northern Australia and New Guinea. All species are widespread (Common and Waterhouse 1981) and can be locally common but details of the life histories have remained unknown until now.

Life Histories

Neohesperilla crocea

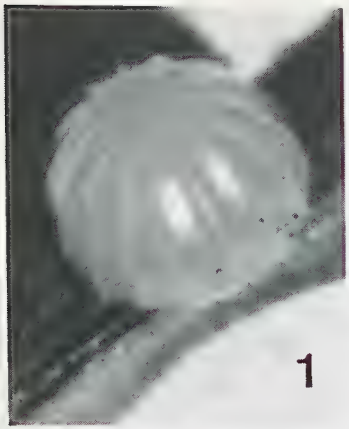
Host plant. *Chrysopogon aciculatus* (Retz) (Poaceae)

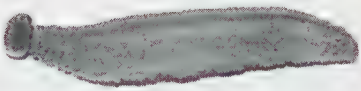
Egg. Hemispherical, 0.8 mm wide, 0.6 mm high, pale green with 22-23 fine vertical ribs.

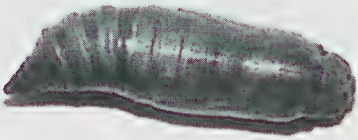
Larva (Fig. 2). First instar: Length 3-6 mm; head shining black; body white, prothoracic plate yellow. Second to final instar: Length 8-19 mm; head black, rugose, covered in fine pubescence; body grey green covered in short club-shaped setae (Fig. 7), dorsal prothorax with dark brown sclerotised plate and small dorso-lateral plate above yellow spiracle, pinkish suffusion on antero-dorsal mesothorax.

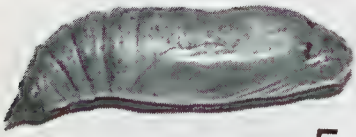
Pupa (Fig. 4). Length 15-19 mm, width 5 mm, pale yellowish brown. Pupal cap (Fig. 7) bearing a pair of round, black spots dorsally and an irregular inverted V-shaped black patch ventrally. Prothoracic plate bearing an irregular series of dark brown spots, spiracular plates raised, black, semicircular. Thoracic and abdominal setae long, pointed, flattened laterally and expanded apically (Fig. 7), mesothorax with a pair of black semicircular patches antero-medially. Abdominal segments with transverse row of setae arising from irregular red-brown blotches.

Cremaster elongate with concave depression dorsally and ventrally, a large oval pit laterally and tip armed with a row of 35-40 hooks.

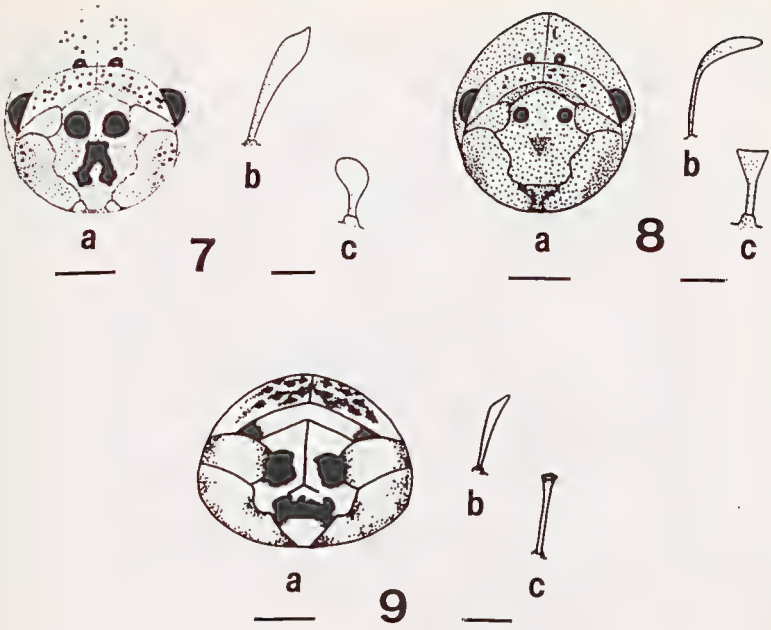








Figs 1-6. *Neohesperilla* spp. intermediate stages. (1) egg of *N. xanthomera*; (2-3) mature larva (2) *N. crocea* (3) *N. senta*; (4-5) pupa (4) *N. crocea* (5) *N. senta*; (6) first instar larval shelter of *N. xanthomera*.



Figs 7-9. Frons of pupa and pupal caps (a), pupal setae (b) and larval setae (c) of *Neohesperilla* spp. (7) *N. crocea*; (8) *N. senta*; (9) *N. xanthomera*. Scale bars a = 1 mm; b, c = 0.2 mm.

Neohesperilla senta

Host plant. *Themeda triandra* Forsk. (Poaceae)

Egg. Hemispherical, 0.9-1.0 mm wide, 0.7-0.8 mm high, creamy white with 18-20 fine vertical ribs.

Larva (Fig. 3). First instar: Length 4-7 mm; head shining black; body whitish, prothoracic plate pale brown. Second to final instar. Length 10-23 mm; head black, finely pitted, bearing numerous fine cream setae; body grey brown, dorsal prothorax with fine transverse black line interrupted medially, dorsal heart dark grey, thoracic and abdominal terga bearing transverse rows of conical setae of variable height (Fig. 8), pink suffusion ventro-laterally on abdominal segments.

Pupa (Fig. 5). Yellow brown, 18-20 mm long. Pupal cap (Fig. 8) with a pair of dorsal black spots bearing numerous setae and with a triangular-shaped central patch of dense setae. Prothorax with scattered dark brown spots, mesothorax with a pair of circular black spots antero-medially. Abdominal terga with 2-3 rows of long hockey stick shaped setae with spatulate ends (Fig. 8). Anal plate blackish composed of a reticulated pattern of fine black

lines. Cremaster golden brown, dorso-ventrally flattened, slight depression dorsally, deep conical pit antero-laterally and tip armed with 4-5 long hooks.

Neohesperilla xanthomera

Host plant. *Heteropogon* sp. (Poaceae)

Egg (Fig. 1). Hemispherical, 0.7-0.8 mm wide, 0.8-0.9 mm high, pale green with 19-21 fine vertical ribs.

Larva. First instar: Length 3-6 mm; head shining black; body cream, prothoracic plate brown. Second to final instar: Length 10-18 mm; head black, finely pitted bearing fine pubescence; body grey brown, prothoracic plate brown, thoracic and abdominal segments bearing transverse rows of long thin setae with flared tips (Fig. 9).

Pupa. Yellow brown, 18-19 mm long. Pupal cap (Fig. 9) with a pair of black dorsal patches and an irregular semicircular black patch ventrally. Prothoracic plate with scattered brown blotches bearing setae. Mesothorax with a pair of black spots antero-medially, remainder with scattered brown blotches. Abdominal segments with 3-4 rows of long laterally flattened setae (Fig. 9) arising from brown blotches. Cremaster elongated, dorsal and ventral surfaces with a central depression, antero-laterally with an oval shaped pit and tip armed with 31-32 long hooks.

Neohesperilla xiphiphora

Host plant. *Schizachyrium perplexum* S.T. Blake (Poaceae)

Egg. Hemispherical, 0.9-1.0 mm wide, 0.8-0.9 mm high, translucent white with 18-19 fine vertical ribs.

First instar larva: Length 4-6 mm; head shining pale brown with scattered setae; prothorax yellow with dorsal brown plate. Thoracic and abdominal segments bearing a single row of clubbed setae, segment 10 and anal plate with six long setae.

Notes

In all species the eggs are laid singly on the underside of the leaves of the host grass. First and second instar larvae construct characteristic shelters (Fig. 6) by folding a single leaf blade through 180° by means of silken hinges on opposite edges of the blade. Later instar larvae construct silken shelters in the base of the grass or in soil and detritus and emerge at night to feed. *N. senta* and *N. xiphiphora* appear to be univoltine whereas *N. crocea* has at least two broods annually. Larvae of *Neohesperilla* spp. are difficult to identify and also resemble those of *Toxidia* spp. which often occur in similar situations. The characteristic shapes of the larval and pupal setae and of the pupal caps enable separation of the individual species.

N. crocea occurs predominantly in wetter areas near rainforest or along the margins of swamps. The males defend territories near breeding areas and rest on the foliage of shrubs or small trees up to 3-4 m from the ground. Females fly close to the ground in the same areas.

Adults of *N. senta* emerge early in the wet season and congregate in areas of fresh regrowth following fires. Both sexes can be taken commonly feeding at flowers of *Grewia retusifolia* Kurz which grows with *T. triandra* in coastal *Eucalyptus platyphylla* F. Muell. forests. Males establish territories in small open areas within the forest and settle on seed heads of the host plant. In successive years adults have only been found in post fire succession areas. First instar larvae appear unable to form shelters and feed on mature *T. triandra* or on regrowth plants growing in full sunshine.

Males of *N. xanthomera* vigorously defend territories on the summits of steep hills and ridges and rest on twigs, rocks or foliage of trees. Females are less commonly encountered flying close to the ground in grassy areas on the lower slopes.

Males of *N. xiphiphora* usually hilltop where they rest on the foliage of trees up to 5 m above the ground. Early in the wet season on southern Cape York Peninsula adults of both sexes can be common flying close to the ground in post fire succession areas. In this situation, males appear not to establish territories but roam widely presumably in search of females. Females show a preference for ovipositing on grasses growing at the base of trees.

With respect to the relationships of *Neohesperilla*, the form of the larva and pupa and the use of grasses as host plants indicate that the genus is closer to *Toxidia* Mabille than *Hesperilla* Hewitson.

Acknowledgments

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Reference

COMMON, I.F.B. and WATERHOUSE, D.F. 1981. *Butterflies of Australia.* Pp. xiv + 682. Angus and Robertson, Sydney.